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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,842	11/15/2005	Atsushi Yamagishi	279167US2PCT	5824

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
EIDE, HEIDI MARIE	

ART UNIT	PAPER NUMBER
3732	

NOTIFICATION DATE	DELIVERY MODE
10/09/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/551,842	YAMAGISHI, ATSUSHI	
	Examiner	Art Unit	
	HEIDI M. EIDE	3732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 28, 2009 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 24-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has added the limitation of a UV cut filter configured to block light of less than 400nm in claims 24-29, however support cannot be found in the originally filed specification for this new limitation. Support for a UV cut filter passing light of at least 400 nm is found, but not a UV cut filter configured to block light of less than 400nm.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-7 and 9-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfano 4,479,499 in view of Evert et al. 6,522,407 (Everett).

3. Alfano teaches a dental caries detecting device comprising an ultraviolet light source 11 (fig. 18-19), a fluorescence receiving portion 27/31 that receives fluorescence from a tooth in response to ultraviolet irradiation of at least two different light intensities from the ultraviolet light source of at least two different light intensities (col. 10, ll. 19-25, 46-47), a fluorescence data analysis portion 33 that analyzes fluorescence data transmitted from the fluorescence receiving portion and a data display portion 35 that displays data analyzed by the fluorescence data analysis portion, the fluorescence data analysis portion analyzing the fluorescence data based on the fluorescence intensities in at least two wavelength bands in a visible light range (col. 9, ll. 61-68, col. 10, ll. 1-41, col. 9, ll. 65-67). Alfano teaches the first wavelength band having a wavelength width from 10 to 30 nm (col. 6, ll. 6-8). Alfano does not specifically teach a wavelength band having a wavelength width from about 10 nm to 260 nm for the first wavelength and 10 nm to 170 nm for the second wavelength, however, does not specify criticality to the claimed ranges in the specification, therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to select the claimed ranges as a

matter of obvious design choice as these parameters are obtained through routine experimentation in determining optimum results.

4. Everett teaches a wavelength width of 50 nm (col. 6, ll. 32-39). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Alfano with the wavelength bands as taught by Everett since these parameters are deemed matters of design choice well within the skill of the ordinary artisan obtained through routine experimentation in determining optimum results and as a matter of design choice.

5. Alfano further teaches the fluorescence data analysis portion analyzing data based on a plurality of fluorescence intensities in at least one wavelength band that changes in response to change in the light intensity of the ultraviolet irradiation (col. 7, ll. 35-43). Alfano teaches the dental carries detecting device wherein the fluorescence data analysis portion calculates the degree of progress of dental caries based on the fluorescence intensity in a first wavelength selected in a wavelength band 600 nm, and the fluorescence intensity in a second wavelength selected from a wavelength band 500nm (col. 10, ll. 3-6). As to claim 4, Alfano further teaches the device wherein the fluorescence intensity is capable of being in a third wavelength. Alfano teaches the fluorescence receiving portion comprises an optical device 27 capable of extracting information related to the fluorescence intensity of the wavelengths. As to claim 9, Alfano teaches a dental caries detecting method detects a dental caries based on fluorescence from a measuring area of a tooth comprising irradiating the measuring area of the tooth with ultraviolet light of at least two different light intensities from a light

source (col. 10, ll. 47-50, fig. 19) obtaining fluorescence information from the measuring area, a second step of obtaining the intensity of the fluorescence in at least two wavelength bands and a third step of carrying out calculation based on the fluorescence intensities and determining the presence/absence of dental caries and/or degree of progress of dental caries based on the result of the calculation (col. 3, ll. 52-59, col. 9, ll. 61-68, col. 10, ll. 1-41). As to claim 10, Alfano teaches the ratio of the signals produced can be used (col. 7, ll. 17-21). Alfano further teaches that a change in the magnitude of the signal will indicate the presence of caries (col. 3, ll. 47-51), therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to the calculation is compared to a known value in order to determine if there is presence of dental caries. As to claim 11, it would have been obvious to one having ordinary skill in the art that if dental caries was detected in the previous step of comparing the value to the lower end of the spectrum, to compare the value with the upper end of the spectrum to determine the severity of the dental caries. As to claim 12, Alfano teaches the method as discussed above including measuring two areas, obtaining fluorescence from the measuring area, obtaining the fluorescence intensities in at least two wavelength bands and calculating a dental caries degree (col. 3, ll. 38-51). As to claims 14 and 23, Alfano teaches the method of obtaining information for at least two different light intensities and calculating the possibility of dental caries and determining that there is a possibility of dental caries if the sign of the result obtained from the formula is positive (col. 7, ll. 6-10). Alfano does not teach calculating the dental carries degree using the exact formulas as claimed however, it would have been obvious to one having

ordinary skill in the art at the time of the invention to use a specific mathematical formula as a matter of obvious choice in known calculations to obtain the desired results. It would have been obvious to one having ordinary skill in the art that if dental caries was detected in the previous step of comparing the value to the lower end of the spectrum, to compare the value with the upper end of the spectrum to determine the severity of the dental caries. Alfano further teaches the dental caries detecting device wherein the output intensity is adjustable (col. 7, ll. 34-43). Alfano further teaches a cut off filter (col. 8, ll. 40-50). Alfano does not specifically teach the filter is configured to block light of less than 400 nm, but teaches this variable is a matter of design choice well within the skill of the ordinary artisan obtained through routine experimentation in determining optimum results (col. 8, ll. 37-51). Alfano does not specifically teach the optical device is a color CCD and a computer to carry out the methods. Everett teaches the optical device is a color CCD (col. 5, ll. 59-60) and a computer (col. 6, ll. 4-5). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Alfano in with the camera and computer taught by Everett since these parameters are deemed matters of design choice and since Everett teaches the use of a photodetector (as taught by Alfano) in place of CCD camera (col. 5, ll. 57-60).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alfano 4,479,499 in view of Evert et al. 6,522,407 (Everett) as applied to claim 7 above, and further in view of Karazivan et al. 2005/0181333 (Karazivan). Alfano in view of Everett does not teach the light source is an LED. Karazivan teaches the light source is an LED

(par. 34). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Alfano in view of Everett further in view of Karazivan as a matter of obvious design choice since Karazivan teaches a variety of light sources including the light source taught by Alfano (par. 34).

Response to Arguments

Applicant's arguments filed July 28, 2009 have been fully considered but they are not persuasive. Regarding applicant's arguments directed towards the 112 rejection of claims 24-29 and the claimed limitation of the filter being configured to block light less than 400 nm not being supported by the specification are not persuasive. Applicant cites support in the specification for a filter passing light of at least 400 nm and argues that it would have been obvious to one having ordinary skill in the that art that if a filter passes light of at least 400 nm it also cuts light below 400 nm, however, theses arguments are not persuasive and it would not have been obvious to one having ordinary skill in the art that the specification teaches the claimed limitations discussed above.

Further applicant argues that Alfano does not include a fluorescence receiving portion, however, applicant has not specifically defined a fluorescence receiving portion, therefore it is being interpreted as a light receiving portion which Alfano teaches. It can be seen in various figures, including fig. 18 that the light is emitted from the light source and received by detectors 27/31 (the flow of the light is indicated by the arrows). Further col. 10, ll. 13-23 discuss the detectors receiving the light. Further applicant argues that Alfano does not teach changing the intensity of the light source, however,

col. 10, ll. 47-48, teaches a light source providing a range of frequencies. Applicant further argues Alfano teaches only one light source being used, however, Alfano teaches two light sources in fig. 17 and one light source in fig. 18. Applicant only claims a single light source; therefore it is unclear what the applicant is trying to argue.

7. With respect to the light source, Everett is only used to teach the claimed wavelength bands, however, as discussed above, the applicant does not specify criticality to the claimed ranges in the specification, therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to select the claimed ranges as a matter of obvious design choice as these parameters are obtained through routine experimentation in determining optimum results.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEIDI M. EIDE whose telephone number is (571)270-3081. The examiner can normally be reached on Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on 571-272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Heidi Eide
Examiner
Art Unit 3732

/Heidi M Eide/
Examiner, Art Unit 3732

3/25/2009

/Cris L. Rodriguez/
Supervisory Patent Examiner, Art Unit 3732